cycle of the first and second converters to tend to minimize the difference in the voltage across the sense resistor;

the current sense circuit, the first pulse width modulator, the second pulse width modulator, the feedback circuit and the control circuits being in a single integrated circuit.

2. The DC to DC switching circuit of claim 1 wherein the sense resistor is external to the integrated circuit.

3. The DC to DC switching circuit of claim 1 further comprised of an integrator having an output responsive to the integral of an error signal, the error signal being responsive to the voltage across the common load and a desired voltage, the control circuits also being responsive to the output of integrator.

4. The DC to DC switching circuit of claim 3 wherein the time constant of the integrator is adjustable by the selection of at least one component external to the integrated circuit.

5. The DC to DC switching circuit of claim 3 further comprised of a differentiator having an output responsive to the rate of change of the voltage across the common load, the control circuits also being responsive to the output of differentiator.

6. The DC to DC switching circuit of claim 5 wherein the time constant of the differentiator is adjustable by the selection of at least one component external to the integrated circuit.

7. The DC to DC switching circuit of claim 1 wherein the control circuits are also responsive to rapid decreases in the voltage on the common load to turn on the first and second converter circuits independent of the phase of the first and second pulse width modulators.

8. The DC to DC switching circuit of claim 7 wherein the control circuits are also responsive to rapid increases in the voltage on the common load to turn off the first and second converter circuits independent of the phase of the first and second pulse width modulators.

9. The DC to DC switching circuit of claim 1 further comprised of a load variation circuit coupled to the control circuits to decrease the voltage on the common load for higher voltages across the current sense resistor and to increase the voltage on the common load for lower voltages across the current sense resistor.

10. DC to DC switching circuit for controlling power switching devices in a DC to DC converter having first and second interleaved converter circuits operating into a common load comprising:

a first pulse width modulator controlling the power switching devices of the first converter circuit;

a second pulse width modulator controlling the power switching devices of the second converter circuit;

a feedback circuit responsive to the voltage across the common load;

control circuits for controlling the first and second pulse width modulators responsive to the feedback circuit;

the control circuits also being responsive to the difference in current through the first converter and the second converter to adjust the relative duty cycle of the first and second converters to tend to minimize the difference in the voltage across the sense resistor;

the current sense circuit, the first pulse width modulator, the second pulse width modulator, the feedback circuit and the control circuits being in a single integrated circuit.

11. The DC to DC switching circuit of claim 10 wherein the commanded output voltage is controllable through an input to the integrated circuit.

12. The DC to DC switching circuit of claim 10 wherein the commanded output voltage is controllable through a digital input to the integrated circuit.

13. The DC to DC switching circuit of claim 12 further comprised of an integrator having an output responsive to the integral of an error signal, the error signal being responsive to the voltage across the common load and a desired voltage, the control circuits also being responsive to the output of integrator.

14. The DC to DC switching circuit of claim 13 wherein the time constant of the integrator is adjustable by the selection of at least one component external to the integrated circuit.

15. The DC to DC switching circuit of claim 13 further comprised of a differentiator having an output responsive to the rate of change of the voltage across the common load, the control circuits also being responsive to the output of differentiator.

16. The DC to DC switching circuit of claim 15 wherein the time constant of the differentiator is adjustable by the selection of at least one component external to the integrated circuit.

17. The DC to DC switching circuit of claim 12 wherein the control circuits are also responsive to rapid decreases in the voltage on the common load to turn on the first and second converter circuits independent of the phase of the first and second pulse width modulators.

18. The DC to DC switching circuit of claim 17 wherein the control circuits are also responsive to rapid increases in the voltage on the common load to turn off the first and second converter circuits independent of the phase of the first and second pulse width modulators.

19. The DC to DC switching circuit of claim 12 further comprised of a load variation circuit coupled to the control circuits to decrease the voltage on the common load for higher currents through the converters and to increase the voltage on the common load for lower currents through the converters.

20. The DC to DC switching circuit of claim 12 wherein the commanded output voltage is controllable through an input to the integrated circuit.

21. The DC to DC switching circuit of claim 12 wherein the commanded output voltage is controllable through a digital input to the integrated circuit.

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